

Biomass

Eighteen riparian headwater reaches were sampled, including the six that were instrumented in relation to stream channel and riparian zone condition. Because there was sometimes more than one cover type in a given transect, there were 30 separate samples representing the eight recognized cover types: (1) old forest (>75 y old), (2) mature forest (50-75 years old), (3) young forest (25-50 years old), (4) successional forest (5-25 years old), (5) recently harvested (0-5 years old), (6) shrub/saplings, (7) perennial crop or fallow field (mostly herbaceous, annual weeds), and (8) annual rowcrop.

There were 25 tree species for which we applied published regression equations for dry biomass based on dbh (Table 4), 13 shrub species for which we developed regression equations for wet biomass (Table 5), and 14 sapling and 14 subcanopy species for which mean wet biomass was determined (Table 6).

Total biomass in the riparian zone of headwater streams ranged from a mean of 20 Mg organic matter (OM)/ha in rowcrop agriculture to 453 Mg OM/ha in old forest (Figure 19 and Table 7). Trees (stems >2.5 cm dbh) constituted 97-99% of live aboveground biomass and 63% of total biomass, ranging from approximately 118 Mg OM/ha in forests 5-50 years old to 287 Mg OM/ha in stands >50 years old (Table 8). Tree biomass was significantly and positively correlated with stand age (Table 9). Herb biomass was highest in perennial herb and shrub/sapling cover types (7-8 Mg OM/ha) where it accounted for the major source of live aboveground biomass. Herb biomass was significantly and negatively correlated with stand age (Table 9). Other aboveground biomass categories (shrubs, saplings, subcanopy trees, seedlings, herbs) constituted only a trivial portion of total living biomass. Detritus biomass included soil organic matter, litter, large down wood, and snags. Mean detrital biomass ranged from 18 Mg OM/ha in the annual rowcrop cover type to 165 Mg OM/ha in mature and old forests (>50 y old) (Table 8).

Soil organic matter comprised the largest component of detrital biomass in all cover types, ranging from 16 Mg OM/ha in rowcrop agriculture to 80 Mg OM/ha in old and mature forest (Table 8). Soils of 5-50 year old forests held 57-70 Mg OM/ha while non-forested soils held between 16 and 42 Mg OM/ha. Soil organic matter was significantly and positively correlated with stand age (Table 9).

Litter was the next largest component of detrital biomass, ranging from 1.5 Mg/ha in the perennial herb cover type to 14 Mg/ha in successional forest to 61 Mg/ha in old and mature forest (Table 8). Litter biomass was significantly and positively correlated with stand age (Table 9). Snag biomass was trivial in all but the oldest forests, which held 17 Mg/ha (Table 8). Snag biomass was not significantly correlated with stand age, probably because sample area was too small to adequately capture variation in biomass. Large down wood (LDW) biomass in forested cover types ranged between 7 and 24 Mg/ha (Table 8). Depending on how much slash was left after clear-cutting, LDW in recently clear-cut forests varied tremendously from 5-100 Mg/ha, but on average constituted about 13% of live tree biomass in the mature forest type. LDW was significantly and positively correlated with stand age (Table 9).